UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OPP OFFICIAL RECORD
HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

OFFICE OF PREVENTION, PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

DATE: 16-JAN-2008

SUBJECT: **Dicamba**: Acute and Chronic Aggregate Dietary (Food and Drinking Water) Exposure and Risk Assessments for the Proposed Section 3 Registration Action on Sweet Corn.

PC Code: 029801 Decision#: 304187
DP#: 347355

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TO: Mary Clock-Rust, Risk Assessor
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and
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Executive Summary

Acute and chronic aggregate dietary (food and drinking water) exposure and risk assessments were conducted for dicamba using the Dietary Exposure Evaluation Model (DEEM-FCID™), Version 2.03 which use food consumption data from the U.S. Department of Agriculture's Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. The analyses were performed to support a Section 3 use request on sweet corn. A cancer dietary assessment was not conducted because dicamba was classified as not likely to be carcinogenic to humans.

Acute and Chronic Dietary (Food and Drinking Water) Exposure Results and Characterization

Tolerance-level residues, DEEM™ ver. 7.76 default processing factors, and 100 percent crop treated (%CT) data were used in the acute and chronic dietary assessments. For both acute and chronic dietary assessments, all population subgroups have risk estimates that are below HED's level of concern. For the acute assessment, the most highly exposed population subgroup is all infants (<1 year old; 11% of the aPAD (acute population-adjusted dose)). For the chronic assessment, the most highly exposed population subgroup is children 1-2 years old (6.7% of the cPAD (chronic population-adjusted dose)). The use of anticipated residues (ARs), empirical processing factors, and % crop treated (CT) would refine further HED's exposure and risk estimates; however, refinement are not needed at this time.

I. Introduction

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (*i.e.*, the dose that HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population-adjusted dose (PAD). The PAD is equivalent to point of departure (POD, NOAEL, LOAEL, e.g.) divided by the required uncertainty or safety factors.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. HED is generally concerned when estimated cancer risk exceeds one in one million. References which discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 21-JUN-2000, web link: http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf ; or see SOP 99.6 (20-AUG-1999).

The most recent dietary risk assessment for dicamba was conducted by Christine Olinger for purposes of the Reregistration Eligibility Decision (RED) (11-AUG-2005; DP#: 317702). This document serves as an update to the dietary assessment for the RED in which sweet corn was not included.

II. Residue Information

Interregional Research Project No. 4 (IR-4) previously submitted a petition (PP#: 0E6209), proposing tolerances for the combined residues of the herbicide dicamba and its 5-hydroxy (5-OH) metabolite (3,6-dichloro-5-hydroxy-o-anisic acid) in/on sweet corn forage, fresh, and stover. The residue chemistry data were reviewed in conjunction with this petition in 2001 (Memo, G. Kramer, 26-JUL-2001; DP#: 271606); however, a dietary assessment that included sweet corn was not conducted at that time.

Dicamba (2-methoxy-3,6-dichlorobenzoic acid) is a selective benzoic acid herbicide registered for the control of weeds prior to or before their emergence. Different forms of dicamba (acid and salt) have registered uses on several food/feed crops including asparagus, barley, corn (field and pop), grasses grown in pasture and rangeland, oats, proso millet, rye, sorghum, soybeans, sugarcane, and wheat (40 CFR §180.227). There are residential uses established for dicamba. The dicamba Registration Standard was dated 12-AUG-1983, followed by a dicamba Second Round Review on 24-MAY-1989. Dicamba is a List A chemical. HED's chapter for the dicamba RED document was issued in 2005 (Memo, C. Olinger, 13-SEP-2005; DP#: 317720).

The residues of concern were determined previously (Memo, C. Olinger, 13-SEP-2005; DP#: 317720). The dicamba risk assessment team deems the conclusions made previously appropriate for the new use as well. Table 1 is a summary of the residues of concern.

Table 1. Residues of Concern in Crops, Livestock, and Drinking Water.

Matrix	Tolerance Expression	Residues for Risk Assessment
Barley, corn, cotton, grasses, oats, proso millet, sorghum, sugarcane, and wheat	Dicamba + 5-OH dicamba	Dicamba + 5-OH dicamba
Asparagus	Dicamba + DCSA*	Dicamba + DCSA
Soybeans and aspirated grain fractions (AGFs)	Dicamba + 5-OH dicamba + DCSA	Dicamba + 5-OH dicamba + DCSA
Livestock	Dicamba + DCSA	Dicamba + DCSA
Drinking Water	NA	Dicamba + DCSA

* DCSA also referred to as 3,6-dichloro-2-hydroxybenzoic acid or as 3,6-dichlorosalicylic acid.

Residue Data used for the Chronic Assessment:

Tolerance-level residues, DEEM™ ver. 7.76 default processing factors, and 100%CT data were used in the acute and chronic dietary assessments. The use of ARs, empirical processing factors, and %CT data would refine further HED's exposure and risk estimates. However, refinements of the dietary exposure estimates are not needed at this time. As this document is an update to the last dietary assessment (sweet corn was included), the residue data used for the RED is included in Table 3 for informational purposes. See Table 2 for a summary of the data used in the acute and chronic assessment.

Table 2. Data and Residue Estimates Used in the Acute and Chronic Dietary Analyses.[1]

RAC	Data Source	Existing Tolerance[2] (ppm)	HED-Recommended or Reassessed Tolerance Level[2] (ppm)
Sweet Corn	DP#: 271606	--	**0.04**
Asparagus	Memo, C. Olinger, 11-AUG-2005; DP#: 317702	4.0	**4.0**
Barley, grain		6.0	**6.0**
Corn, field, grain		**0.50**	TBD
Corn, pop, grain		**0.50**	TBD
Cottonseed		**0.50**	TBD
Millet, grain		**5.0**	TBD
Oat, grain		**0.50**	TBD
Sorghum, grain		3.0	**4.0**
Sugarcane, cane		**0.10**	TBD
Sugarcane, molasses		2.0	**5.5**
Wheat, grain		**2.0**	TBD
Fat (cattle, goat, hog, horse, sheep)		0.20	**0.30**
Kidney (cattle, goat, hog, horse, sheep)		1.5	**25**
Liver (cattle, goat, hog, horse, sheep)		1.5	**3.0**
Meat (cattle, goat, hog, horse, sheep)		0.20	**0.25**
Meat byproducts (cattle, goat, hog, horse, sheep)		0.20	**3.0**
Milk		0.30	**0.2**

[1] 100% CT were assumed for all commodities, as well as DEEM™ ver. 7.76 default processing values.
[2] Bolded value for each RAC was residue value used in the acute/chronic assessments.

III. Drinking Water Data

The drinking water residues used in the dietary risk assessment were provided by the Environmental Fate and Effects Division (EFED) in a memorandum by I. Abdel-Saheb (31-MAY-2005; DP#: 317705), and were estimated using the highest use rate, application to sugarcane at 2.8 lbs ai/A. Table 3 below provides a summary of the model estimates for drinking water from surface water sources. Surface water estimates were used in acute and chronic food and water dietary exposure assessments. For purposes of this assessment, the highest (*i.e.*, most conservative) values were used for the acute (**367 ppb; parent + DCSA** (357 µg/L + 10.1 µg/L)) and chronic (**13.75 ppb; parent + DCSA** (13 µg/L + 0.75 µg/L)) assessments. The model and its description are available at the EPA internet site: http://www.epa.gov/oppefed1/ models/water/.

Table 3. *EDWC to Be Used for Exposure to Dicamba Acid, and its Degradate DCSA in Drinking Water.*

Crop (application method)	Model EDWCs (µg/L)					
	Dicamba			DCSA		
	Acute	One-in-10-year annual mean	36 year overall mean	Acute	One-in-10-year annual mean	36 year overall mean
Surface Water						
FL-Sugarcane (Ground)	**357**	**13**	5.23	**10.1**	**0.75**	0.4
FL-Sugarcane (Aerial)	346	12.9	5.38	10.9	0.813	0.47
LA-Sugarcane (Ground)	233	9.74	3.13	8.79	0.66	0.32
LA-Sugarcane (Aerial)	230	9.74	3.44	9.74	0.73	0.39
Note that these estimates assume one application @ 2.8 lb ai/A (parent); and 0.446 lb ai/A (DCSA) and a crop area factor of 0.87						

IV. DEEM-FCID™ Program and Consumption Information

Dicamba acute and chronic dietary exposure assessments were conducted using the DEEM-FCID™, Version 2.03 which incorporates consumption data from USDA's CSFII, 1994-1996 and 1998. The 1994-96, 98 data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g., apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For chronic exposure assessment, consumption data are averaged for the entire U.S. population and within population subgroups. Based on analysis of the 1994-96, 98 CSFII consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50+ years old.

For chronic dietary exposure assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

V. Toxicological Information

The toxicological endpoints used in this assessment are presented in Table 4, and were selected by the dicamba team in meetings held on 02-AUG-2005 and 04-AUG-2005. The dicamba risk assessment team confirmed that the endpoints selected previously remain appropriate.

Table 4. Summary of Toxicological Doses and Endpoints for Dicamba for Use in Dietary Risk Assessments.

Exposure Scenario	Dose Used in Risk Assessment, UF	Uncertainty/FQPA Safety Factors and Level of Concern for Risk Assessment	*Study and Toxicological Effects*
Acute Dietary (General population including infants and children	LOAEL = 300 mg/kg/day UF = **300** **Acute RfD** = 1 mg/kg/day	FQPA SF = 1X **aPAD** = acute RfD / UFs = 1.0 mg/kg/day	**Acute Neurotoxicity Study in Rats** LOAEL = **300** mg/kg/day (LDT) based on clinical signs of neurotoxicity.
Chronic Dietary (All populations)	NOAEL= **45** mg/kg/day UF = **100** **Chronic RfD** = 0.45 mg/kg/day	FQPA SF = 1X **cPAD** = chronic RfD / UFs = 0.45 mg/kg/day	**Multi-generation Reproduction Study in Rats** LOAEL=136 mg/kg/day based on impaired pup growth (decreased pup weights).

UF = uncertainty factor, FQPA SF = FQPA safety factor, NOAEL = no-observed-adverse-effect-level, LOAEL = lowest-observed-adverse-effect-level, PAD = population-adjusted dose (a = acute, c = chronic), LDT = lowest-dose tested.

VI. Results/Discussion/Conclusions

The DEEM-FCID™ analysis estimates the dietary exposure of the U.S. population and various population subgroups. The results for the acute and chronic assessments reported in Tables 4 and 5 are for the U.S. Population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, females 13-49, males 20-49, and adults 50+ years. A cancer dietary assessment was not conducted because dicamba was classified as not likely to be carcinogenic to humans.

The acute and chronic dietary exposure assessments (using tolerance level residues and 100% CT information for all registered and proposed uses) were conducted for the general U.S. population and various population subgroups. Drinking water values were incorporated directly into the acute and chronic dietary assessments. These assessments conclude that the acute and chronic dietary exposure estimates are not of concern to HED for the general U.S. population or any population subgroup. For the acute assessment, the most highly exposed population subgroup is all infants (<1 year old; 11% of the aPAD). For the chronic assessment, the most highly exposed population subgroup is children 1-2 years old (6.7% of the cPAD). The use of ARs, empirical processing factors, and %CT data would refine further HED's exposure and risk estimates; however, refinements are not needed at this time.

Table 5. Summary of Dietary Exposure and Risk for Dicamba.

Population Subgroup	Acute Dietary[1] (95th Percentile)		Chronic Dietary[1]	
	Dietary Exposure (mg/kg/day)	%aPAD*	Dietary Exposure (mg/kg/day)	% cPAD*
U.S. Population (total)	0.044066	4.4	0.012091	2.7
All Infants (< 1 year old)	0.109311	**11**	0.020233	4.5
Children 1-2 years old	0.076605	7.6	0.030196	**6.7**
Children 3-5 years old	0.068164	6.8	0.027604	6.1
Children 6-12 years old	0.048314	4.8	0.018991	4.2
Youth 13-19 years old	0.032048	3.2	0.011752	2.6
Adults 20-49 years old	0.034236	3.4	0.009961	2.2
Adults 50+ years old	0.026832	2.7	0.007616	1.7
Females 13-49 years old	0.031439	3.1	0.008935	2.0

[1] Acute dietary endpoint of 1.0 mg/kg/day applies to the general U.S. population and all population subgroups. Chronic dietary endpoint of 0.45 mg/kg/day applies to the general U.S. population and all population subgroups.
* The highest %aPAD and %cPAD are bolded.

VII. List of Attachments

Attachment 1: DEEM-FCID™ Acute Residue Input File.
Attachment 2: DEEM-FCID™ Acute Results File.
Attachment 1: DEEM-FCID™ Chronic Residue Input File.
Attachment 1: DEEM-FCID™ Chronic Results File.

cc: S. Levy
RDI: DESAC (03-JAN-2008)
S. Levy:S10953:PY1:(703)305-0783:7590P

Attachment 1: DEEM-FCID™ Acute Residue Input File.

U.S. Environmental Protection Agency Ver. 2.02
DEEM-FCID Acute analysis for DICAMBA
Residue file name: C:\Documents and Settings\slevy\Desktop\029801a_SL.R98
Analysis Date 01-11-2008 Residue file dated: 01-11-2008/13:45:38/8
Reference dose: aRfD = 1 mg/kg bw/day NOEL = 300 mg/kg bw/day
Comment: Surface Water Tier 1

EPA Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	#2	Comment
95000190	O	Asparagus	4.000000	1.000	1.000	
15000250	15	Barley, pearled barley	6.000000	1.000	1.000	
15000251	15	Barley, pearled barley-babyfood	6.000000	1.000	1.000	
15000260	15	Barley, flour	6.000000	1.000	1.000	
15000261	15	Barley, flour-babyfood	6.000000	1.000	1.000	
15000270	15	Barley, bran	6.000000	1.000	1.000	
21000440	M	Beef, meat	0.250000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.250000	1.000	1.000	
21000450	M	Beef, meat, dried	0.250000	1.920	1.000	
21000460	M	Beef, meat byproducts	3.000000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	3.000000	1.000	1.000	
21000470	M	Beef, fat	0.300000	1.000	1.000	
21000471	M	Beef,fat-babyfood	0.300000	1.000	1.000	
21000480	M	Beef, kidney	25.000000	1.000	1.000	
21000490	M	Beef, liver	3.000000	1.000	1.000	
21000491	M	Beef, liver-babyfood	3.000000	1.000	1.000	
15001200	15	Corn, field, flour	0.500000	1.000	1.000	
15001201	15	Corn, field, flour-babyfood	0.500000	1.000	1.000	
15001210	15	Corn, field, meal	0.500000	1.000	1.000	
15001211	15	Corn, field, meal-babyfood	0.500000	1.000	1.000	
15001220	15	Corn, field, bran	0.500000	1.000	1.000	
15001230	15	Corn, field, starch	0.500000	1.000	1.000	
15001231	15	Corn, field, starch-babyfood	0.500000	1.000	1.000	
15001240	15	Corn, field, syrup	0.500000	1.500	1.000	
15001241	15	Corn, field, syrup-babyfood	0.500000	1.500	1.000	
15001250	15	Corn, field, oil	0.500000	1.000	1.000	
15001251	15	Corn, field, oil-babyfood	0.500000	1.000	1.000	
15001260	15	Corn, pop	0.500000	1.000	1.000	
15001270	15	Corn, sweet	0.040000	1.000	1.000	
15001271	15	Corn, sweet-babyfood	0.040000	1.000	1.000	
95001280	O	Cottonseed, oil	5.000000	1.000	1.000	
95001281	O	Cottonseed, oil-babyfood	5.000000	1.000	1.000	
23001690	M	Goat, meat	0.250000	1.000	1.000	
23001700	M	Goat, meat byproducts	3.000000	1.000	1.000	
23001710	M	Goat, fat	0.300000	1.000	1.000	
23001720	M	Goat, kidney	25.000000	1.000	1.000	
23001730	M	Goat, liver	3.000000	1.000	1.000	
24001890	M	Horse, meat	0.250000	1.000	1.000	
27002220	D	Milk, fat	0.200000	1.000	1.000	
27002221	D	Milk, fat - baby food/infant for	0.200000	1.000	1.000	
27012230	D	Milk, nonfat solids	0.200000	1.000	1.000	

27012231	D	Milk, nonfat solids-baby food/in	0.200000	1.000	1.000
27022240	D	Milk, water	0.200000	1.000	1.000
27022241	D	Milk, water-babyfood/infant form	0.200000	1.000	1.000
27032251	D	Milk, sugar (lactose)-baby food/	0.200000	1.000	1.000
15002260	15	Millet, grain	0.500000	1.000	1.000
15002310	15	Oat, bran	0.500000	1.000	1.000
15002320	15	Oat, flour	0.500000	1.000	1.000
15002321	15	Oat, flour-babyfood	0.500000	1.000	1.000
15002330	15	Oat, groats/rolled oats	0.500000	1.000	1.000
15002331	15	Oat, groats/rolled oats-babyfood	0.500000	1.000	1.000
25002900	M	Pork, meat	0.250000	1.000	1.000
25002901	M	Pork, meat-babyfood	0.250000	1.000	1.000
25002910	M	Pork, skin	0.250000	1.000	1.000
25002920	M	Pork, meat byproducts	3.000000	1.000	1.000
25002921	M	Pork, meat byproducts-babyfood	3.000000	1.000	1.000
25002930	M	Pork, fat	0.300000	1.000	1.000
25002931	M	Pork, fat-babyfood	0.300000	1.000	1.000
25002940	M	Pork, kidney	25.000000	1.000	1.000
25002950	M	Pork, liver	3.000000	1.000	1.000
15003280	15	Rye, grain	2.000000	1.000	1.000
15003290	15	Rye, flour	2.000000	1.000	1.000
26003390	M	Sheep, meat	0.250000	1.000	1.000
26003391	M	Sheep, meat-babyfood	0.250000	1.000	1.000
26003400	M	Sheep, meat byproducts	3.000000	1.000	1.000
26003410	M	Sheep, fat	0.300000	1.000	1.000
26003411	M	Sheep, fat-babyfood	0.300000	1.000	1.000
26003420	M	Sheep, kidney	25.000000	1.000	1.000
26003430	M	Sheep, liver	3.000000	1.000	1.000
15003440	15	Sorghum, grain	4.000000	1.000	1.000
15003450	15	Sorghum, syrup	4.000000	1.000	1.000
06003470	6	Soybean, seed	10.000000	1.000	1.000
06003480	6	Soybean, flour	10.000000	1.000	1.000
06003481	6	Soybean, flour-babyfood	10.000000	1.000	1.000
06003490	6	Soybean, soy milk	10.000000	1.000	1.000
06003491	6	Soybean, soy milk-babyfood or in	10.000000	1.000	1.000
06003500	6	Soybean, oil	10.000000	1.000	1.000
06003501	6	Soybean, oil-babyfood	10.000000	1.000	1.000
95003620	O	Sugarcane, sugar	0.100000	1.000	1.000
95003621	O	Sugarcane, sugar-babyfood	0.100000	1.000	1.000
95003630	O	Sugarcane, molasses	5.000000	1.000	1.000
95003631	O	Sugarcane, molasses-babyfood	5.000000	1.000	1.000
86010000	O	Water, direct, all sources	0.367000	1.000	1.000
86020000	O	Water, indirect, all sources	0.367000	1.000	1.000
15004010	15	Wheat, grain	2.000000	1.000	1.000
15004011	15	Wheat, grain-babyfood	2.000000	1.000	1.000
15004020	15	Wheat, flour	2.000000	1.000	1.000
15004021	15	Wheat, flour-babyfood	2.000000	1.000	1.000
15004030	15	Wheat, germ	2.000000	1.000	1.000
15004040	15	Wheat, bran	2.000000	1.000	1.000

Attachment 2: DEEM-FCID™ Acute Results File.

U.S. Environmental Protection Agency Ver. 2.02
DEEM-FCID ACUTE Analysis for DICAMBA (1994-98 data)
Residue file: 029801a_SL.R98 Adjustment factor #2 used.
Analysis Date: 01-11-2008/13:50:09 Residue file dated: 01-11-2008/13:45:38/8
NOEL (Acute) = 300.000000 mg/kg body-wt/day
Daily totals for food and foodform consumption used.
Run Comment: "Surface Water Tier 1"

Summary calculations (per capita):

95th Percentile			99th Percentile			99.9th Percentile		
Exposure	%aRfD	MOE	Exposure	%aRfD	MOE	Exposure	%aRfD	MOE
U.S. Population:								
0.044066	4.41	6808	0.069246	6.92	4332	0.121895	12.19	2461
All infants:								
0.109311	10.93	2744	0.163853	16.39	1830	0.239661	23.97	1251
Children 1-2 yrs:								
0.076605	7.66	3916	0.105629	10.56	2840	0.463867	46.39	646
Children 3-5 yrs:								
0.068164	6.82	4401	0.092946	9.29	3227	0.360642	36.06	831
Children 6-12 yrs:								
0.048314	4.83	6209	0.066940	6.69	4481	0.098919	9.89	3032
Youth 13-19 yrs:								
0.032048	3.20	9360	0.049258	4.93	6090	0.072574	7.26	4133
Adults 20-49 yrs:								
0.034236	3.42	8762	0.051533	5.15	5821	0.084585	8.46	3546
Adults 50+ yrs:								
0.026832	2.68	11180	0.036459	3.65	8228	0.061465	6.15	4880
Females 13-49 yrs:								
0.031439	3.14	9542	0.046573	4.66	6441	0.078833	7.88	3805

Attachment 3: DEEM-FCID™ Chronic Residue Input File.

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for DICAMBA 1994-98 data
Residue file: C:\Documents and Settings\slevy\Desktop\029801c_SL.R98
Adjust. #2 used
Analysis Date 01-11-2008 Residue file dated: 01-09-2008/17:42:28/8
Reference dose (RfD) = 0.45 mg/kg bw/day
Comment:Surface Water Tier 1

Food Crop EPA Code	Grp	Food Name	Residue (ppm)	Adj.Factors #1	#2	Comment
95000190	O	Asparagus	4.000000	1.000	1.000	
15000250	15	Barley, pearled barley	6.000000	1.000	1.000	
15000251	15	Barley, pearled barley-babyfood	6.000000	1.000	1.000	
15000260	15	Barley, flour	6.000000	1.000	1.000	
15000261	15	Barley, flour-babyfood	6.000000	1.000	1.000	
15000270	15	Barley, bran	6.000000	1.000	1.000	
21000440	M	Beef, meat	0.250000	1.000	1.000	
21000441	M	Beef, meat-babyfood	0.250000	1.000	1.000	
21000450	M	Beef, meat, dried	0.250000	1.920	1.000	
21000460	M	Beef, meat byproducts	3.000000	1.000	1.000	
21000461	M	Beef, meat byproducts-babyfood	3.000000	1.000	1.000	
21000470	M	Beef, fat	0.300000	1.000	1.000	
21000471	M	Beef,fat-babyfood	0.300000	1.000	1.000	
21000480	M	Beef, kidney	25.000000	1.000	1.000	
21000490	M	Beef, liver	3.000000	1.000	1.000	
21000491	M	Beef, liver-babyfood	3.000000	1.000	1.000	
15001200	15	Corn, field, flour	0.500000	1.000	1.000	
15001201	15	Corn, field, flour-babyfood	0.500000	1.000	1.000	
15001210	15	Corn, field, meal	0.500000	1.000	1.000	
15001211	15	Corn, field, meal-babyfood	0.500000	1.000	1.000	
15001220	15	Corn, field, bran	0.500000	1.000	1.000	
15001230	15	Corn, field, starch	0.500000	1.000	1.000	
15001231	15	Corn, field, starch-babyfood	0.500000	1.000	1.000	
15001240	15	Corn, field, syrup	0.500000	1.500	1.000	
15001241	15	Corn, field, syrup-babyfood	0.500000	1.500	1.000	
15001250	15	Corn, field, oil	0.500000	1.000	1.000	
15001251	15	Corn, field, oil-babyfood	0.500000	1.000	1.000	
15001260	15	Corn, pop	0.500000	1.000	1.000	
15001270	15	Corn, sweet	0.040000	1.000	1.000	
15001271	15	Corn, sweet-babyfood	0.040000	1.000	1.000	
95001280	O	Cottonseed, oil	5.000000	1.000	1.000	
95001281	O	Cottonseed, oil-babyfood	5.000000	1.000	1.000	
23001690	M	Goat, meat	0.250000	1.000	1.000	
23001700	M	Goat, meat byproducts	3.000000	1.000	1.000	
23001710	M	Goat, fat	0.300000	1.000	1.000	
23001720	M	Goat, kidney	25.000000	1.000	1.000	
23001730	M	Goat, liver	3.000000	1.000	1.000	
24001890	M	Horse, meat	0.250000	1.000	1.000	
27002220	D	Milk, fat	0.200000	1.000	1.000	
27002221	D	Milk, fat - baby food/infant for	0.200000	1.000	1.000	

27012230	D	Milk, nonfat solids	0.200000	1.000	1.000
27012231	D	Milk, nonfat solids-baby food/in	0.200000	1.000	1.000
27022240	D	Milk, water	0.200000	1.000	1.000
27022241	D	Milk, water-babyfood/infant form	0.200000	1.000	1.000
27032251	D	Milk, sugar (lactose)-baby food/	0.200000	1.000	1.000
15002260	15	Millet, grain	0.500000	1.000	1.000
15002310	15	Oat, bran	0.500000	1.000	1.000
15002320	15	Oat, flour	0.500000	1.000	1.000
15002321	15	Oat, flour-babyfood	0.500000	1.000	1.000
15002330	15	Oat, groats/rolled oats	0.500000	1.000	1.000
15002331	15	Oat, groats/rolled oats-babyfood	0.500000	1.000	1.000
25002900	M	Pork, meat	0.250000	1.000	1.000
25002901	M	Pork, meat-babyfood	0.250000	1.000	1.000
25002910	M	Pork, skin	0.250000	1.000	1.000
25002920	M	Pork, meat byproducts	3.000000	1.000	1.000
25002921	M	Pork, meat byproducts-babyfood	3.000000	1.000	1.000
25002930	M	Pork, fat	0.300000	1.000	1.000
25002931	M	Pork, fat-babyfood	0.300000	1.000	1.000
25002940	M	Pork, kidney	25.000000	1.000	1.000
25002950	M	Pork, liver	3.000000	1.000	1.000
15003280	15	Rye, grain	2.000000	1.000	1.000
15003290	15	Rye, flour	2.000000	1.000	1.000
26003390	M	Sheep, meat	0.250000	1.000	1.000
26003391	M	Sheep, meat-babyfood	0.250000	1.000	1.000
26003400	M	Sheep, meat byproducts	3.000000	1.000	1.000
26003410	M	Sheep, fat	0.300000	1.000	1.000
26003411	M	Sheep, fat-babyfood	0.300000	1.000	1.000
26003420	M	Sheep, kidney	25.000000	1.000	1.000
26003430	M	Sheep, liver	3.000000	1.000	1.000
15003440	15	Sorghum, grain	4.000000	1.000	1.000
15003450	15	Sorghum, syrup	4.000000	1.000	1.000
06003470	6	Soybean, seed	10.000000	1.000	1.000
06003480	6	Soybean, flour	10.000000	1.000	1.000
06003481	6	Soybean, flour-babyfood	10.000000	1.000	1.000
06003490	6	Soybean, soy milk	10.000000	1.000	1.000
06003491	6	Soybean, soy milk-babyfood or in	10.000000	1.000	1.000
06003500	6	Soybean, oil	10.000000	1.000	1.000
06003501	6	Soybean, oil-babyfood	10.000000	1.000	1.000
95003620	O	Sugarcane, sugar	0.100000	1.000	1.000
95003621	O	Sugarcane, sugar-babyfood	0.100000	1.000	1.000
95003630	O	Sugarcane, molasses	5.000000	1.000	1.000
95003631	O	Sugarcane, molasses-babyfood	5.000000	1.000	1.000
86010000	O	Water, direct, all sources	0.013750	1.000	1.000
86020000	O	Water, indirect, all sources	0.013750	1.000	1.000
15004010	15	Wheat, grain	2.000000	1.000	1.000
15004011	15	Wheat, grain-babyfood	2.000000	1.000	1.000
15004020	15	Wheat, flour	2.000000	1.000	1.000
15004021	15	Wheat, flour-babyfood	2.000000	1.000	1.000
15004030	15	Wheat, germ	2.000000	1.000	1.000
15004040	15	Wheat, bran	2.000000	1.000	1.000

Attachment 4: DEEM-FCID™ Chronic Results File.

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for DICAMBA (1994-98 data)
Residue file name: C:\Documents and Settings\slevy\Desktop\029801c_SL.R98
Adjustment factor #2 used.
Analysis Date 01-11-2008/13:51:43 Residue file dated: 01-09-2008/17:42:28/8
Reference dose (RfD, Chronic) = .45 mg/kg bw/day
COMMENT 1: Surface Water Tier 1

Total exposure by population subgroup

Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Percent of Rfd
U.S. Population (total)	0.012091	2.7%
U.S. Population (spring season)	0.012310	2.7%
U.S. Population (summer season)	0.011903	2.6%
U.S. Population (autumn season)	0.012049	2.7%
U.S. Population (winter season)	0.012112	2.7%
Northeast region	0.011694	2.6%
Midwest region	0.012764	2.8%
Southern region	0.011563	2.6%
Western region	0.012561	2.8%
Hispanics	0.012258	2.7%
Non-hispanic whites	0.012005	2.7%
Non-hispanic blacks	0.012049	2.7%
Non-hisp/non-white/non-black	0.013225	2.9%
All infants (< 1 year)	0.020233	4.5%
Nursing infants	0.006872	1.5%
Non-nursing infants	0.025305	5.6%
Children 1-6 yrs	0.027838	6.2%
Children 7-12 yrs	0.018123	4.0%
Females 13-19 (not preg or nursing)	0.010127	2.3%
Females 20+ (not preg or nursing)	0.007983	1.8%
Females 13-50 yrs	0.009554	2.1%
Females 13+ (preg/not nursing)	0.010157	2.3%
Females 13+ (nursing)	0.010602	2.4%
Males 13-19 yrs	0.013284	3.0%
Males 20+ yrs	0.010271	2.3%
Seniors 55+	0.007457	1.7%
Children 1-2 yrs	0.030196	6.7%
Children 3-5 yrs	0.027604	6.1%
Children 6-12 yrs	0.018991	4.2%
Youth 13-19 yrs	0.011752	2.6%
Adults 20-49 yrs	0.009961	2.2%
Adults 50+ yrs	0.007616	1.7%
Females 13-49 yrs	0.008935	2.0%

13544

R156948

Chemical: Dicamba

PC Code: 029801
HED File Code: 14000 Risk Reviews
Memo Date: 1/16/2008
File ID: DPD347355
DPD317702
DPD271606
DPD317720
DPD317705
Accession #: 000-00-0124

HED Records Reference Center
3/11/2008